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CURRENT LITERATURE.

BOOK REVIEWS.

Elements of paleobotany.¹

THE great needs of recent years in paleobotany have been a summary of the scattered materials and the delimitation of well-founded data from those which are more or less uncertain. A great stride forward has been taken along these lines and as a result we are in a position to speak more categorically as to plant fossils. The first part of Professor Seward's work appeared some time ago and has been reviewed in these pages.² Almost simultaneously three valuable works have recently appeared, one in English by Professor Scott,³ one in German by Potonié, and the one which is the subject of this review.⁴ The standpoint of the three works is somewhat different, Scott taking more the standpoint of the morphologist, Potonié of the stratigrapher, while Zeiller combines the botanical and geological standpoints, though giving more emphasis to the botanical side. More than any book that has yet appeared, this is a book to be used with impunity by general readers and elementary students. The first chapter treats of the various methods by which plant fossils have been preserved, then follows a chapter on classification and nomenclature. The body of the book, of course, is made up of descriptions of the various fossil forms treated in order. The cuts are simple but clear and good, and the descriptions are doubtless the shortest and clearest that are found anywhere.

The conservatism of the author is shown at many points, and the difference between established and hypothetical data is clearly brought out. As an illustration of this, Zeiller constantly distinguishes between forms based on leaves and forms based on reproductive organs, as in the ferns. There are interesting discussions of the Sphenophylleæ and the Cycadofilices, though the author does not go so far as some in erecting these forms into great groups by themselves.

At the close of the book are two chapters of extreme interest. The chapter on the succession of floras and climates is wonderfully graphic, and it is doubtful if a better summary of the known facts was ever written, certainly not in a shorter compass. The author theorizes but little from the

¹ This review also appears in the *Journal of Geology*.

² Bot. Gaz. 26:59. 1898. ³ Bot. Gaz. 30:352. 1900.

⁴ ZEILLER, R.: *Éléments de Paléobotanique*. 8vo. pp. 421, with 210 illustrations, Paris: Georges Carré et C. Naud. 1900.

facts presented, and such deductions as he makes in regard to climate are conservative. The last chapter will be somewhat startling to many readers, as Zeiller thinks there is very little evidence from fossil plants in favor of gradual evolution. He states that in almost every case, species, genera, families, and groups appear highly specialized and in their permanent form from the first. So-called intermediate forms like *Cheirostrosbus* appear long after the forms they are supposed to connect. Genera and species that vary now have always varied, and the limits of variation now and in the past have been the same and definitely prescribed. In short, Zeiller believes that the evolution of all groups is a matter almost purely of speculation. Doubtless most botanists will fail to accept Zeiller's views as to evolution, and yet it may be well to put a brake now and then to unlimited speculation; a perusal of Zeiller's final chapter certainly compels one to do that.—H. C. COWLES.

Plant diseases.

IN 1882 the first edition of Robert Hartig's *Lehrbuch der Baumkrankheiten* appeared. This book met with instant favor and was at once recognized as a standard reference work for diseases of trees, especially those caused by the higher fungi. In 1889 the second edition appeared and the favorable reception accorded the first edition was repeated. The third edition has now been issued—this time, however, with a changed title.⁵ The change of name from *Baum-* to *Pflanzenkrankheiten* would naturally lead one to expect that the discussion of the subject had been extended so as to include non-woody plants not considered in the previous editions. This is not the case, however, for practically the same plants are treated in the edition before us as in the others. The work is still confined in the main to diseases of woody plants. This is shown by the fact that of the 280 figures only eleven illustrate diseases or parasitic fungi of non-woody plants. Thirty-one pages are given to the discussion of the rusts affecting woody plants and a little over two pages to those affecting non-woody plants. Aside from about six pages given to smuts and short references under *Claviceps purpurea*, *Cystopus candidus*, *Plasmodiophora brassicae*, and the bacterial diseases of hyacinths and potato, the other notes on diseases of non-woody plants caused by fungi are only incidental. The book is divided into five main headings, viz.: (1) injuries caused by plants; (2) diseases caused by atmospheric influences; (3) diseases caused by the action of injurious substances; (4) diseases due to soil conditions; (5) wounds. With the exception of one or two paragraphs, however, consideration is given under the last four heads to woody plants only.

⁵ HARTIG, ROBERT: *Lehrbuch der Pflanzenkrankheiten*. Für Botaniker, Forstleute, Landwirthe, und Gärtner. Dritte, völlig neu bearbeitete Auflage des Lehrbuches der Baumkrankheiten. 8vo. pp. ix + 324. figs. 280. pl. 1 (colored). Berlin: Julius Springer. 1900. M 10.